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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,894	06/09/2006	Gary W. Ferrell	SEZ-022	2856

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SCHNECK & SCHNECK
P.O. BOX 2-E
SAN JOSE, CA 95109-0005

EXAMINER	
COLEMAN, RYAN L	
ART UNIT	PAPER NUMBER
1792	
MAIL DATE	DELIVERY MODE
07/21/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/559,894	FERRELL ET AL.	
	Examiner	Art Unit	
	RYAN COLEMAN	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *1* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-63* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

2. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

3. In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group 1, claim(s) 1-11, 14-24, 26-30, 32-39, 41-48, 57-60, 62, and 63 drawn to methods of removing particles from a surface with acoustic energy.

Group 2, claim(s) 12, 13, 25, 31, 40, 49-56, and 61 drawn to apparatuses for removing particles from a surface with acoustic energy.

4. The inventions listed as Groups 1 and 2 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Each of the method species is summarized below, and the only technical feature that is shared among the method species is that one or more particles are being removed from a surface with acoustic transducers. Similarly, each of the apparatus species is summarized below, and the only technical feature that is shared among the apparatus species is that acoustic transducers are in contact with liquid such that acoustic energy is transferred to a surface in order to remove one or more particles from the surface. The shared technical feature between Group 1 and Group 2 is thus the concept of

cleaning a surface with acoustic energy that is produced by a transducer and propagated between the transducer and targeted surface with a liquid medium. This is not a special technical feature because the technical feature is well known in the cleaning art. For example, applicant teaches the technical feature in the "Background Art" section of applicant's specification.

5. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Method Species 1 (claims 1-11): methods of removing particles from a surface that involves testing the performance of one or more transducers in a test liquid prior to immersing the one or more transducers in a particle removal liquid in order to treat a targeted surface.

Method Species 2 (claims 14-24): a method of removing particles from a surface that involves immersing the targeted surface in a container that contains particle removal liquid and has transducers disposed on opposite walls of the container that are arranged such that the concentration of the generated acoustic cavities is approximately uniform between the two transducers.

Method Species 3 (Claims 26-30): a method of removing particles from a surface that involves immersing the targeted surface in a container that is coupled to one or more transducers and contains particle removal liquid. The method involves adding a cavity enhancement liquid to the particle removal liquid.

Method Species 4 (Claims 32-39): a method of removing particles from a surface that involves placing acoustical cavity sensors opposite one or more transducers in a container filled with particle removal liquid and using the sensors to determine if the distribution of cavities is desirable.

Method Species 5 (Claims 41-48): a method of removing particles from a surface that involves placing a thin sheet within a container that has a transducer and a targeted surface disposed within particle removal liquid. The thin sheet is disposed between the particle removal liquid and a test liquid, and secondary energy pulses are generated within the test liquid when energy pulses from the transducer impact the thin sheet.

Method Species 6 (Claim 57-60): methods of removing particles from an object's surface that involves placing an object on a holder within particle removal liquid and moving the holder within the liquid. Cavitation energy is applied to the object's surface by a transducer.

Method Species 7 (Claims 62-63): a method of removing particles from a surface that involves calculating the number of transducers needed to provide the cleaning power necessary for removing at least one particle from a surface. The method involves immersing the calculated number of transducers within particle removal liquid such that the generated cavitation energy can remove at least one particle from the targeted surface.

Apparatus Species 1 (Claim 12 and 13): apparatuses for removing particles from a surface comprising a container of test liquid in which an assembly of transducers can be tested and an assembly repositioning system that can move the transducer

assembly to a particle removal liquid such that the transducer assembly can be used to remove particles from a surface immersed in the particle removal liquid.

Apparatus Species 2 (Claim 25): apparatus for removing particles from a surface comprising a container having a first transducer assembly on a first wall of the container and a second transducer assembly on an opposite wall of the container.

Apparatus Species 3 (Claim 31): apparatus for removing particles from a surface comprising a container having particle removal liquid, cavity enhancement liquid, and one or more connected transducers. The apparatus has a controllable transducer activation mechanism that is arranged to establish a selected cavity density within the container's liquid such that once the selected cavity density is formed, at least one of the following actions is taken: the concentration of cavity enhancement liquid is reduced and/or the activation energy of the one or more transducers is reduced.

Apparatus Species 4 (Claim 40): apparatus for removing particles from a surface comprising an array of acoustical cavity sensors that are spaced apart from one or more transducers disposed within particle removal liquid.

Apparatus Species 5 (Claim 49): apparatus for removing particles from a surface comprising a container containing particle removal liquid and a thin sheet within the container that separates the particle removal liquid from test liquid. At least one transducer is adjacent the particle removal liquid, and a light sensor is positioned adjacent the test liquid.

Apparatus Species 6 (Claims 50-56 and 61): apparatuses for removing particles from a surface comprising an object holder that holds an object and moves it within a

container holding particle removal liquid while at least one transducer applies cavitation energy to the particle removal liquid.

6. Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

7. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: the summaries of the method species and the summaries of the apparatus species are provided above. The shared technical feature among the method species and the shared technical feature among the apparatus species is the concept of cleaning a surface with acoustic energy that is produced by a transducer and propagated between the transducer and targeted surface with a liquid medium. This is not a special technical feature because the technical feature is well known in the cleaning art. For example, applicant teaches the technical feature in the "Background Art" section of applicant's specification.

8. A telephone call was made to Thomas Schneck on July 15, 2009 to request an oral election to the above restriction requirement, but did not result in an election being made.

9. Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the

requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

10. The election of an invention or species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

11. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN COLEMAN whose telephone number is (571)270-7376. The examiner can normally be reached on Monday-Friday, 9-5.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571)272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RLC/
Ryan L. Coleman
Patent Examiner, Art Unit 1792
July 17, 2009
/Michael Kornakov/
Supervisory Patent Examiner, Art Unit 1792